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ABSTRACT

The old "nature versus nurture" argument has resurfaced in a new guise--the role of inherent ability or of education as the source of skill and the reason for achievement. Research shows that even one additional year of schooling raises a person's wages. Even when the relationship among education, productivity, and wages appears obvious, there is evidence for two arguments. The screening argument holds that investments in education reveal the job-relevant abilities and skills that students already possess--stopping some while allowing others to pass through the mesh. The human capital model argues that skills are acquired through investment in education, which adds to the overall volume of ability. Driving this debate is the notion of the returns provided both to the individual and society by educational attainment. However, structural changes in the economy, changes in policy, and shifts in demographics illustrate how societal trends contribute to the fluctuations in returns to education. Recommendations to find the most effective location for educational attainment include the following: developing better means of determining job-relevant abilities, encouraging business-school networks, increasing retention and educational attainment, and making educational loans and financial aid more accessible to students for whom investment in educational attainment shows real promise. (YLB)

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Challenge: To develop incentives for investment in educational attainment in order to produce a more productive, more competitive workforce.

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	What does the research tell us?	How can policy address it?
Enterprises	Employers often fail to communicate their needs for certain types of skills, even though they clearly determine rewards for educational attainment.	Ascertain exactly what qualities firms want their employees to possess and develop better measures of job-relevant abilities; facilitate local networks between businesses and schools to ensure that agreed-upon standards are met.
Schools	As educational suppliers, schools are too often content to operate as screens that reveal inherent ability and not as vehicles through which valuable skills are imparted.	Increase educational attainment by encouraging students to remain in school and by properly preparing them for the workforce or for post-secondary education.
Workers	Most students and workers are willing to accept the burden of loans or deferred earnings in order to increase educational attainment.	Help students to make sound financial decisions by providing necessary information; improve financial aid mechanisms to increase opportunity for educational attainment.

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"The Educational Payoff"

The old nature versus nurture argument has resurfaced in a new guise—the role of inherent ability or of education as the source of skill and the reason for achievement. At the heart of the discussion are practical questions: would increased investment in educational attainment better serve employers, schools, and individuals and, on a grander scale, bolster the nation's economic and social well-being? How do the goals of reducing attrition rates and increasing attainment of post-secondary education weigh in the equation?

The debate hinges on the effect of schooling itself on achievement. There is, first of all, the intrinsic risk that if schools do not expend their resources effectively, pouring more money into the educational system may only amount to a waste of scarce funds. The crux of the issue, however, is whether inherent ability, not quality or quantity of schooling, determines a person's likelihood for "success," or whether education directly enhances students' talents and confers fundamental skills. If, in fact, schools do more to reveal than to augment capabilities, increased public and individual investment in education may not really affect American competitiveness.

At present, monetary "rates of return" (wages of earners) serve as the only practical measure of educational outcome. Research has shown that even one additional year of schooling, with or without a credential, raises a person's wages. Similarly, people who have degrees—high school or college—make significantly more money than those who don't, even if they hold the same position. What is it about the educational experience that employers both seek out and reward? Does the degree or extra year simply indicate to employers a level of motivation and ability that an individual already possesses? Although education yields individual returns, it is still unclear how much of that return is the result of learning in the classroom—and how those skills translate in the workplace.

The Education Debate: Screen or Vehicle?

In a society that relies heavily on credentials for signaling workforce preparedness, job markets stress educational degrees—in part, because more direct measures of skills and competencies are expensive and difficult to obtain. Because the relationship between academic degrees and skills required in the workplace is indirect, there is doubt about what academic degrees actually contribute to job performance. There is ample evidence that employers consider attitudes to be a strong determinant of job success, but it

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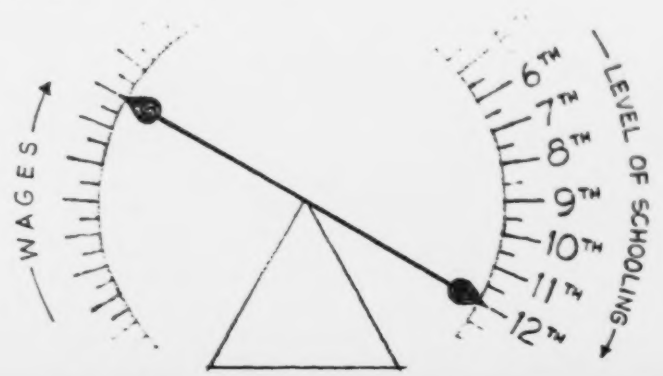
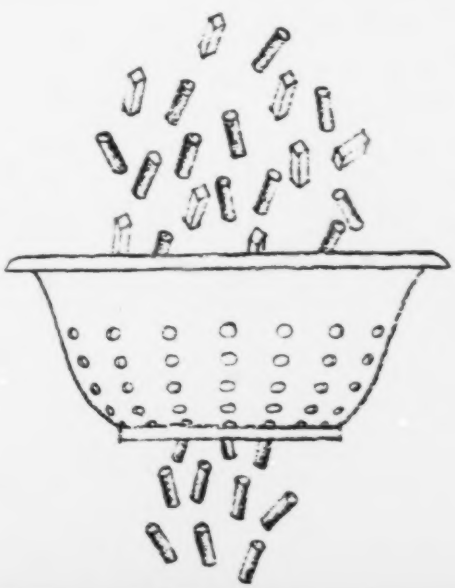


is as difficult to confirm whether these attitudes are formed or simply revealed by classroom experience.

Even when the relationship between education, productivity, and wages appears to be obvious, there is some evidence for both arguments: that education functions as a screen which identifies the most capable students; and that education represents a vehicle for individual and societal growth and opportunity. In applied fields such as engineering, for example, course work relates specifically to on-the-job activity, so that success is practically impossible without formal training. On the other hand, good grades even in these programs are poor predictors of performance in engineering jobs—perhaps indicating that what a student learns in the classroom may not be the main factor driving job performance.

To implement intelligent policy and avoid the misdirection of funds, these "opposing" views must find some synthesis. Research designates two positions in this debate, known as the "screening" and "human capital" arguments. The screening argument essentially holds that investments in education reveal the job-relevant abilities and skills that students already possess. Admission to selective colleges and graduate programs, for example, identifies students with desirable characteristics, as does the ability to complete demanding programs. The human capital model, on the other hand, argues that any increase in wages associated with educational credentials is primarily the result of skills and abilities that were acquired through investment in education.

To the extent that the screening model holds true, spending to expand educational attainment through public policy may be a poor investment, an expensive way of revealing information that does not create new capabilities or potential. Here, school doubles as a sieve—sifting and sorting students based on some level of talent or ability, stopping some while allowing others to pass through the mesh. A study by Paul Taubman comparing the relationship between educational levels and earnings of twins with identical genetic make-up found that they tended to earn similar amounts even after controlling for education. Screening arguments do not necessarily assume that abilities are genetically based, but Taubman's study is an example of how inherent ability influences what an individual achieves, despite environmental influences.



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On the other hand, if the human capital model is accurate, then investments in education and training that result in higher wages for individuals also generate new capabilities and ultimately improve the economy's performance. Such investments are easier to justify for public policy

because they not only identify but actually improve individual learning and general productivity. Think of a glass, half-filled with water, which represents the student's preexisting capabilities. Education adds to the volume of ability, raising the level of liquid in the glass. Schooling, in this vision, becomes value-added—constantly enlarging the potential of the individual and improving skills which are transferred on the job. The money invested produces a return of significantly greater value through increased earning and learning potential.

As an example, Alan Krueger and Joshua Angrist's study investigates the impact of additional schooling on earnings for students who did not complete high school. Compulsory school requirements specify the *age* to which, but not the number of years that, a student must stay in school before dropping out. Students born earlier in the calendar year begin school at a younger age, placing them one grade ahead of those born later in the same year. Among students who left school at the minimum age, those with an additional year of schooling command significantly higher wages—9 percent per additional year. For employers, some element of that extra year signifies either the expansion of skills or the development of attitudes, which translates into advantages in the job market.

The human capital model argues that skills are acquired through investment in education, which adds to the overall volume of ability.

Returns to Education: Fuel for the Fire

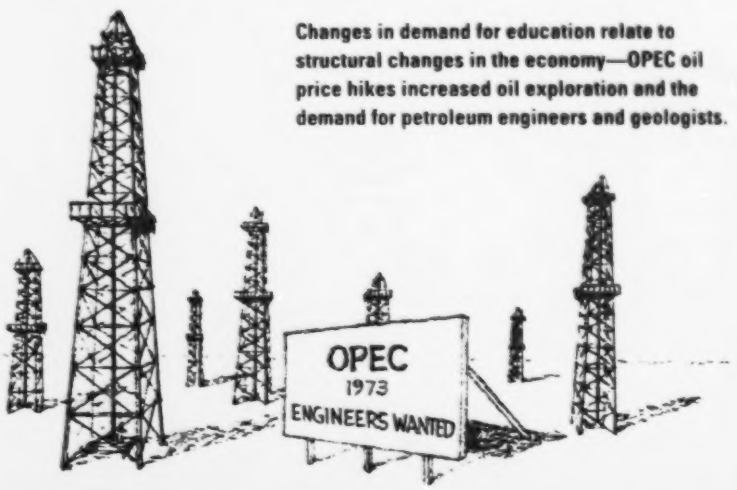
Driving this debate is the notion of the returns, both to the individual and society, that educational attainment furnishes—in the job market through increased wages and higher levels of skill, and in the macro economy by improving productivity and competitiveness. The problem with these arguments is that skill and ability are difficult to measure, and studies (such as the ones mentioned above) revert to wages as a concrete gauge of success and capability. This measure, the rate of return to education, is a relative concept, comparing the percent increase in earnings associated with schooling to earnings without schooling. The actual rate may not generalize returns beyond the individual level, but it relates to the ways in which policy shapes the level of education in the economy: directly, through mandatory schooling laws; and, indirectly, through tuition subsidies and other incentives that reduce the cost of securing additional education. Within this framework, students make decisions as individuals on the amount of education they will receive and whether the real burden assumed in the form of loans or deferred earnings is an investment worth making.

The framework falls short, however, because the rate of return only reflects personal gain and offers a measure for something that cannot be captured purely by wages. The real value of these figures lies in the dramatic variation in the rate of return to education since World War II and its relationship to the dynamics of educational supply and enterprise demand in the labor market. Supply changes, associated with variations in the number of people in an age cohort and the average amount of education they receive, are easiest to track. Introduc-

ing universal education in the 1300s, for example, greatly expanded the supply of workers able to perform clerical work; the relative wage and social position of clerks fell dramatically as a result. Changes in the demand for education relate to structural changes in the economy that expand the need for certain occupations and contract the need for others. This relationship was apparent, for example, when OPEC oil price hikes dramatically increased new oil exploration and the demand for petroleum engineers and geologists, rapidly raising their wages.

Changes in policy and shifts in demographics, such as the G.I. Bill and the entrance of the "baby boom" cohort into the workforce, are also examples of the ways in which societal trends contribute to the fluctuation in returns to education. When the G.I. Bill expanded access to education, it helped to offset the increased demand for educated workers produced by the tremendous post-war industrial expansion. At that time, college graduates were paid a premium 2.5 times the wages of high school graduates. In comparison, the "baby boomers"—a generation not only larger in population but also who stayed in school longer than their predecessors—dramatically increased the supply of college graduates, causing their earnings to fall steadily throughout the late 1960s. By 1974, college graduates earned only 1.2 times the wages of high school graduates. This sharp decline in the returns to college contributed to the view that the U.S. contained a workforce of "overeducated Americans."

Recent increases in demand point toward an inflation in the returns to college education. No one expects a revival of the heavy industries that produced high-paying jobs for high school graduates, and the continuing collapse of earnings for these workers should keep the *relative* earnings of college graduates high. Signs of shifts in the distribution of occupations toward jobs that require more education also appear on the horizon. In short, education will continue to be a good investment through the foreseeable future. Indeed, the fact that the returns to education are rising faster than can be explained by changes in supply is often taken as evidence that the demands for education must be rising. The current rate, with inflation running between 3 and 4 percent, offers an investment in education that earns 10 or 11 percent—which constitutes an attractive financial investment for individuals, in addition to the social and personal benefits that education provides.



Changes in demand for education relate to structural changes in the economy—OPEC oil price hikes increased oil exploration and the demand for petroleum engineers and geologists.

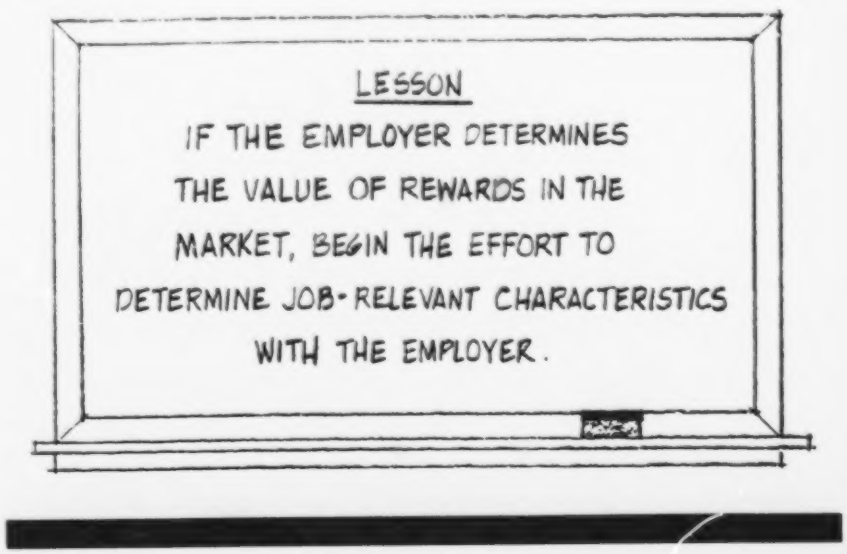
While dollar figures and percentages may imperfectly represent rewards for ability, the *concept* of rates of return to education can inform investment in education. All of the dynamics influencing its fluctuation over time speak to policy in different ways—considering changes in demographics and attainment; watching occupational trends; becoming aware of the changes in the workplace itself, particularly where demands for workers with higher skills

are increasing. In this sense, supply and demand not only serve as a gauge for personal investment, they indicate one answer to the education debate: if rewards for education shift, and if it is the employer who ultimately determines the value of these rewards in the market, then begin the effort to determine job-relevant characteristics with the employer. Employers perceive differences in employees who have more credentials or even an extra year of education—and that is the point. Find out first which characteristics warrant the higher wages before attempting to ascertain whether they were bestowed at birth or in the classroom.

To do its job properly, education should serve effectively as both screen and enhancer: challenging students to reveal their talent and providing tools for students to develop skills and abilities. The *solution* here involves policy that links enterprises, schools, and individuals—to optimize the benefits of education, increase the level of productivity in the workforce, and reward students for their individual investments. If employers could properly identify and signal workforce needs to schools, they in turn would have direction for curricular reform to better satisfy those needs and impart the necessary skills. Individuals in this case would be better able to make decisions about educational attainment.

Public Policy: Striking a Balance

There are circumstances in which increased investment in educational attainment becomes ineffective: when students acquire more formal education than the labor market demands, and when misdirected funding is wasted on programs which do nothing to augment skills. It may be that the glass which contains inherent ability and the contributions of education has a specific volume, limiting the benefits of the returns that investment offers. After a certain point, the glass might simply overflow—particularly if business doesn't signal what it needs in its employees and if policy cannot locate the places where these skills originate or are imparted.



It is imperative, then, to develop skill standards and achievement tests that provide screens for abilities which are cheaper and more efficient than educational credentials. If impending educational reform includes initiatives that relate education more closely to the job market, public policy should seek to enhance the effect of education on job-relevant abilities. Schools must make use of their existing resources, undergoing a kind of systemic reform that improves the quality of the workforce and subsequently influences the competitiveness of the nation.

We offer the following recommendations, to be considered at the outset of any discussion, to find the most effective location for educational investment.

- **Develop better means of determining job-relevant abilities, particularly at the high-school level.** Schools could improve intern and co-op programs to allow employers to assess directly student job performance as well as additional measures of performance in school: motivation, comportment, teamwork, and interpersonal skills. Employers could signal how these qualities provide proxies for future job performance that are superior to educational credentials. The gain would be a better fit between students and jobs and a better gauge of how much—or how little—education is required for a particular job.

- **Encourage networks between businesses and schools by tying educational requirements and standards to regions and subsequently to regional labor markets.** As employers make clear the kinds of skills they demand, job-relevant abilities could be imparted at the secondary level. Firms, schools, and policymakers working concertedly should ensure that these characteristics are incorporated into educational programs.

- **Increase retention and educational attainment.** An investment that could increase the number of students who graduate from high school is certainly worth making. The sharp drop in earnings for high school "drop-outs" indicates that even more should be done to build on the considerable progress already made this past decade in reducing attrition rates. Alan Krueger's evidence alone, which determines gains from additional schooling even for those who do not complete high school, makes a case for raising the age for compulsory schooling.

- **Make educational loans and financial aid more accessible to qualified students for whom an investment in educational attainment shows real promise.** All that is needed are the mechanisms: policy could direct improvements in student loans and other arrangements that allow students to pay for education with the financial benefits they receive later in life. A recent example is President Clinton's plan to substitute national service for the payment of educational loans, which would provide students not only with affordable credentials but also a guarantee of employment and job experience upon graduation. In addition, most financial aid programs favor traditional students between the ages of 17 and 21. Reform of financial aid should give greater consideration to the "new majority" of non-traditional students who do not enter college directly upon graduation from high school.

Finding alternative methods for screening would begin to reconcile the problem of determining where—and how much—investment in education is beneficial. However, if at present it does nothing more than to increase high school retention and assist in the attainment of post-secondary education, it is money well spent. Investing in education compares to spending on upgrading the nation's infrastructure or modernizing industrial plants: the long-term benefits overshadow the immediate expense. And although research should not lead simply to a call for more research, we need to determine what knowledge, skills, and abilities are really needed on the job—and how to impart these characteristics, not simply reveal them, through education—transforming the classroom experience from an opaque screen to a vehicle that carries prepared students to the workplace.

— Peter Cappelli and Maria Iannozzi

The National Center on the Educational Quality of the Workforce

EQW is a partnership between one of this nation's premier business schools and one of its leading graduate schools of education. Established by the University of Pennsylvania's Wharton School and Graduate School of Education under a cooperative agreement with the U.S. Department of Education, EQW's program of research and policy analysis takes as its principal challenge the renewal of American competitiveness through leveraged investments in the quality of the nation's workforce.

The EQW research agenda focuses on four broad questions:

1. What do employers need to know to better use the skills their workers bring with them and acquire in the workplace?
2. How can schools and other providers become more effective suppliers of skilled and disciplined workers?
3. How can workers develop more complete skills portfolios that combine the competencies and disciplines a productive economy requires?
4. What is the best role for public policy in the development of a work-related education and training market that efficiently links consuming firms, supplying schools, and educated workers?

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For this issue, the Sounding Board consisted of senior scholars, policy analysts concerned with the educational quality of the workforce, and members of an EQW Washington Public Policy seminar.

The research for this issue included the following:

Joshua Angrist and Alan Krueger. 1991. "Does Compulsory Schooling Affect Schooling and Earnings?" *The Quarterly Journal of Economics* 106(4): 979-1014.

Peter Cappelli. 1992. "Is the Skills Gap Really about Attitudes?" EQW Working Paper Number WP01. Philadelphia, PA: National Center on the Educational Quality of the Workforce.

Peter Cappelli. 1992. "College and the Workplace: How Should We Assess Student Performance?" EQW Working Paper Number WP09. Philadelphia, PA: National Center on the Educational Quality of the Workforce.

Paul Taubman. 1975. *Sources of Inequality in Earnings: Personal Risks, Random Events, Preference Toward Risks and Other Occupational Characteristics.* New York: America Elsevier Publishing Company.

Paul Taubman and Jody DeMatteo. 1992. "Report of the Conference on the Rate of Return to Education." EQW Draft in Circulation. Philadelphia, PA: National Center on the Educational Quality of the Workforce.

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